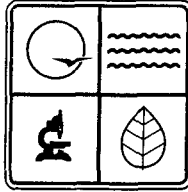


DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION



PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **01 2006 - 001** Project Number: **2005-09-010**

Owner: **O' Brien Industrial Holdings, LLC.**

Owner's Address: **4641 McRee Avenue, St. Louis, MO 63110**

Installation Name: **Christy Minerals, LLC.**

Installation Address: **833 Booneslick Road, P.O. Box 159, High Hill, MO 63350**

Location Information: **Montgomery County, S32, T48N, R4W**

Application for Authority to Construct was made for:

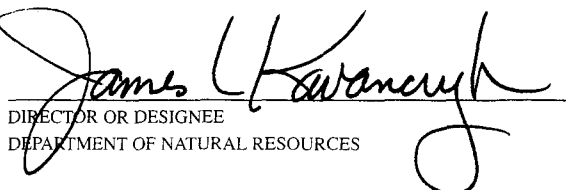
Installation of an unloading station, a silo storage, a grinder, and a pneumatic conveying system to feed Biomass fuel into an existing kiln. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.*

☐ Standard Conditions (on reverse) are applicable to this permit.

☒ Standard Conditions (on reverse) and Special Conditions (listed as attachments starting on page 2) are applicable to this permit.

JAN 5 2006

EFFECTIVE DATE


DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional Office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed Special Conditions as provided in RSMo 643.075. If you choose to appeal, the Air Pollution Control Program must receive your written declaration within 30 days of receipt of this permit.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Department of Natural Resources has established the Outreach and Assistance Center to help in completing future applications or fielding complaints about the permitting process. You are invited to contact them at 1-800-361-4827 or (573) 526-6627, or in writing addressed to Outreach and Assistance Center, P.O. Box 176, Jefferson City, MO 65102-0176.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention Construction Permit Unit.

2005-09-010

O' Brien Industrial Holdings, LLC.

4641 McRee Avenue, St. Louis, MO 63110

Christy Minerals, LLC.

833 Booneslick Road, P.O. Box 159, High Hill, MO 63350

Montgomery County, S32, T48N, R4W

Installation of an unloading station, a silo storage, a grinder, and a pneumatic conveying system to feed Biomass fuel into an existing kiln. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Christy Minerals, LLC.
Montgomery County, S32, T48N, R4W

Performance Testing

1. Christy Minerals, LLC. shall demonstrate compliance with the emission factors listed in Table 1 by performing stack tests within 180 days after the startup of biomass fuel in the rotary kiln.

Table 1: Emission Factors as proposed in the application

Emission Point	Point Description	Pollutants	Emission Factors	Unit
EP1012WH	Rotary Kiln – Biomass Fired	NO _x	2.0	Lb/ton of biomass
		Particulate Matter less than 10-micron in diameter (PM ₁₀) – Filterable & Condensable	0.088	Lb/ton of biomass

The applicable test methods and procedures for the permitted pollutants are summarized next. An alternate method(s) of quantifying the emission factors of pollutants may be used in place of the above testing requirement, if requested by Christy Minerals, LLC. and approved by the Director. An alternate testing method can also be used if approved by the Compliance Unit of the Air Pollution Control Program.

- A. The test methods and procedures outlined at 40 CFR 60 Appendix A, Method 7E shall be adhered to by the applicant in testing for NO_x.
 - B. The test methods and procedures outlined at 40 CFR Part 51, Appendix M, Methods 201, 201A, and 202 shall be adhered to by the applicant in testing for PM₁₀.
 - C. The above test procedures shall have at least 3 test runs and minimum test time of 1-hour.
2. The date on which performance tests are conducted must be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test date so that this Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to

conducting the required emission testing.

3. Two (2) copies of a written report of the performance test results shall be submitted to the Director of the Air Pollution Control Program within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA Method for at least one (1) sample run.
4. Christy Minerals, LLC. shall submit a revised construction permit application within sixty (60) days of the performance test reports submittal if the performance test indicates that the emissions measured during the stack test are actually higher than those estimated in this permit.
5. In lieu of the above stack tests requirement, Christy Minerals can submit documentation to demonstrate that emission factors will be below or equal to those stated in Table 1. These documentation must be approved by the Air Pollution Control Program in order to use them in lieu of the above stack tests requirement.

Baghouse(s) – Operation, Maintenance and Record Keeping Requirements

6. Christy Minerals, LLC. shall control PM₁₀ emissions from the Rotary Kiln using a baghouse as specified in the permit application. The baghouse associated with the above emission source must be in use at all times when the associated equipment is in operation.
7. The baghouse(s) and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. Replacement bags for the baghouse(s) shall be kept on hand at all times and shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
8. The baghouse(s) shall be equipped with a gauge or meter, which indicates the pressure drop across the baghouse(s). This gauge or meter shall be located such that it may be easily observed by Missouri Department of Natural Resources' (DNR) employees.
9. Christy Minerals, LLC. shall monitor and record the operating pressure drop across the baghouse(s) at least once in every week that the Rotary Kiln is operated. The operating pressure drop shall be maintained within the normal operating range specified by the manufacturer's performance warranty. If the pressure drop reading should fall outside of this normal operating range, then the associated equipment shall be shut down as quickly as is reasonably practical. Corrective actions shall be taken to address the cause of the non-normal pressure drop and the baghouse(s) shall be returned to normal operation before re-starting the equipment.
10. Christy Minerals, LLC. shall inspect the baghouses at least once every six (6)

months and at a minimum conduct the following activities:

- a. Check the cleaning sequence of the baghouse for proper operation;
- b. Thoroughly inspect the bags for leaks and signs of wear;
- c. Inspect all components of the control system that are not subject to wear or plugging, including structural components, housing, ducts, hoods, etc.; and
- d. If leaks or abnormal conditions are found during these inspections, the appropriate remedial actions shall be implemented before re-starting the equipment.

- 11. Christy Minerals, LLC. shall maintain an operating, maintenance and inspection log for the baghouse(s) which shall include the following:
 - a. Incidents of malfunction(s) including the date(s) and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction;
 - b. Any maintenance activities conducted on the unit, such as bag replacement, replacement of equipment, etc.; and
 - c. A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

Restriction on Biomass

- 12. Biomass fuels to be used in the Coal Fired Rotary Kiln shall be limited to hard wood and soft wood chips, saw dust, bark, and composite wood products and dusts. Christy Minerals shall not burn any composite wood materials that contain glues.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2005-09-010
Installation ID Number: 139-0008
Permit Number:

Christy Minerals, LLC.
833 Booneslick Road, P.O. Box 159
High Hill, MO 63350

Complete: September 2, 2005
Reviewed: October 13, 2005

Parent Company:
O' Brien Industrial Holdings, LLC.
4641 McRee Avenue
St. Louis, MO 63110

Montgomery County, S32, T48N, R4W

REVIEW SUMMARY

- Christy Minerals, LLC. has applied for authority to install an unloading station, a silo storage, a grinder, and a pneumatic conveying system to feed Biomass fuel into an existing kiln.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment, but in insignificant amount.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- An existing baghouse is being used to control the particulate matter emissions from the rotary kiln.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential Emissions of PM₁₀ are at de minimis level.
- This installation is located in Montgomery County, an attainment area for all criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is required as specified in Special Condition 1.
- Addition of the equipment in this permit qualifies as an off-permit change to your Part 70 Operating Permit.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Christy Minerals, LLC. processes clay for the manufacture of refractory materials (i.e. fire brick, etc.) at their installation in High Hill, Missouri. This installation is considered an existing major source of air pollutants. The installation was issued a Part 70 operating permit (OP1999108) on August 13, 1999.

The refractory industry manufactures brick and structural clay products from clay, shale, or a combination of these two (2). The manufacture of refractory materials involves the mining, grinding, screening, and blending of the above raw materials. The blended raw material is then formed, cut or shaped into the desired shape(s), dried, fired, and cooled before the final brick or structural clay product is stored and eventually shipped off site. The following New Source Review (NSR) permits have been issued to Christy Minerals Company from the Air Pollution Control Program.

Table 2: Previously Issued New Source Review Permits

Permit Number	Description
0393-020	Replacement of an outdated crusher and sizing screen with fully enclosed equipment. The conditions established in this permit were superceded by the conditions of Permit No. 1296-018.
0194-001	Modification to Permit Number 0393-020 to allow increased production. The conditions established in this permit were superceded by the conditions of Permit No. 1296-018.
1296-018 & 1296-018A	A Section (5) permit issued on November 19, 1996 for the addition of two (2) ball mill systems. All construction and/or modification projects after May 13, 1992 for this installation were limited to the de minimis level of 15 tons per year of PM ₁₀ .
0898-030	A Section (5) permit issued on August 31, 1998 to re-configure the installation operations and to replace some existing equipment with new equipment at the plant including two (2) 50 ton bins, two (2) 9" screw augers, and a pneumatic collection system. The installation has also applied to add a semi-portable crushing/screening system and a semi-portable screening system.
082000-020	Replacement of an existing shaker spreader (Kinergy KDF 60-50) with a new gravity Spreader (LB & W 1.5), raising of the existing Moginson screen up one (1) floor and construction of a new Rotex screen (Model 803 DAMM) at the existing Moriginson screen elevation.
082000-019	Addition of a pneumatic conveying system, an automated palletizer and two (2) new sackers. This project will also allow the installation to utilize more of the capacity of two (2) sackers currently in operation.
082000-018	Replacement of a rubber belted stacker being cooled with a water spray with a new metal stacker that will be enclosed and vented to a baghouse.
082000-019A	Extension of Permit Number 082000-019.
082000-018A	Extension of Permit Number 082000-018

PROJECT DESCRIPTION

Christy Minerals, LLC. proposed to burn Biomass fuel in their current Coal Fired Rotary Kiln. In order to feed Biomass to the kiln, Christy Minerals will install an unloading station for trucks, a storage silo, a grinder, and a pneumatic conveying system. Except for the unloading station from the truck, the storage silo, the grinder, and the conveying system will be totally enclosed. Modification of the current coal fan will be made to allow the system to be used for both Biomass and Coal. After these modifications, the system will allow Christy Minerals to use 100% Biomass, 100% Coal, or a Blend of Biomass and Coal. As specified in Special Condition 14, biomass fuels shall be limited to hard wood and soft wood chips, saw dust, bark, and composite wood products and dusts. According to the application, this process is capable of handling 12,000 pounds of biomass per hour.

EMISSIONS/CONTROLS EVALUATION

The emission factors used for the combustion of biomass in the rotary kiln are obtained from the sample test reports of several wood fired boilers and furnaces. These emission factors will be verified through performance testing as specified in Special Condition 1. The emission factors for transfer and handling of sawdust are obtained from Factor Information Retrieval (FIRE) V6.23, *Source Classification Codes and Emission Factors Listings for Criteria Air Pollutants* (SCC: 30700803). An existing baghouse is being used to control the particulate matter emissions from the rotary kiln.

Potential minus actual emissions test is performed for the modification of the rotary kiln. No emission changes are expected for the purpose of burning coal. As per as the emission factors provided in the application, emissions are expected to decrease for the purpose of burning biomass. Potential emissions of the application represent the potential of the new equipment (EP1019: Biomass truck unloading), assuming continuous operation (8760 hours per year). Existing actual emissions were taken from the Emissions Inventory Questionnaire (EIQ) submitted by the applicant for 2004. The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions*	Existing Actual Emissions (2004 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	911.58	71.58	9.46	N/A
SO _x	40.0	1116.90	272.1	N/A	N/A
NO _x	40.0	823.90	113.71	N/A	N/A
VOC	40.0	56.60	0.03	N/A	N/A
CO	100.0	438	81.22	N/A	N/A
HAPs	10.0/25.0	N/D	N/D	N/A	N/A

N/A = Not Applicable; N/D = Not Determined

*Existing potential emissions are obtained from Permit Numbers 022000-020, 022000-019, and 022000-018.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential Emissions of PM₁₀ are at de minimis level.

APPLICABLE REQUIREMENTS

Christy Minerals, LLC. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Fuad Wadud
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 31, 2005, received September 2, 2005, designating O' Brien Industrial Holdings, LLC. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Factor Information Retrieval (FIRE) V6.23, *Source Classification Codes and Emission Factors Listings for Criteria Air Pollutants*.
- St. Louis Regional Office Site Survey, dated September 14, 2005.